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Pesticide Fact Sheet Number 26
Daminozide (Alar)

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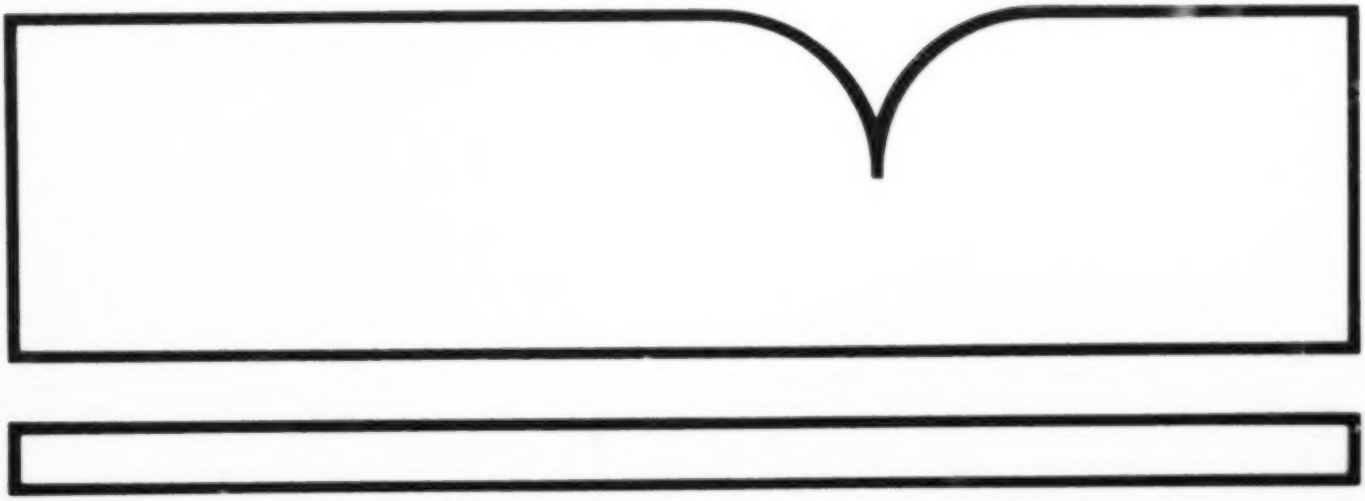

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This document contains up-to-date chemical information, including a summary of the Agency's regulatory position and rationale, on a specific pesticide or group of pesticides. A Fact Sheet is issued after one of the following actions has occurred.

1. Issuance or reissuance of a registration standard,
2. Issuance of each special review document,
3. Registration of a significantly changed use pattern,
4. Registration of a new chemical, or
5. An immediate need for information to resolve controversial issues relating to a specific chemical or use pattern.

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EPA

Pesticide Fact Sheet

Name of Chemical: DAMINOZIDE (Alar)
Reason for Issuance:
Date Issued: June 30, 1984
Fact Sheet Number: 26

Description of Chemical

Common Name: Daminozide
Chemical Name: Butanedioic acid mono(2,2-dimethylhydrazine), Succinic acid 2,2-dimethylhydrazide
Trade Name: Alar, Kylar, SADH, B-nine, B-995, aminozide,
EPA Shaughnessy Code: 035101
Chemical Abstracts Service (CAS) Number: 1596-84-5
Pesticide Type: Plant Growth Regulator
Chemical Family: Amino Acid Derivative
U.S. and Foreign Producers: Uniroyal and Aceto Chemical

Use Patterns and Formulations

Daminozide is a plant growth regulator registered as a 5 percent water soluble liquid or 85 percent water soluble dry concentrate formulation. The amount of daminozide that is applied as a field spray ranges from 0.9 to 6.8 pounds active ingredient per acre per year, depending of the crop, time of application and desired effects. Daminozide controls the vegetative and reproductive growth of orchard crops such as apples, cherries, nectarines, peaches, prunes and pears. In addition, daminozide use enhances shorter and more erect peanut vines or modifies the stem length and shape of ornamental plants. Other minor uses of daminozide include: Brussels sprouts (California), cantaloupes (California and Arizona), grapes, and tomatoes.

Scientific Findings

o Summary Science Statement

Daminozide is a white, water soluble solid. Data indicate that daminozide has low acute toxicity, low dermal irritation potential and is neither teratogenic nor mutagenic. Daminozide and its UDMH contaminant cause oncogenic effects. A tolerance reassessment cannot be performed at this time. Daminozide leaches from soil, but is not persistent. Daminozide is not an acute toxicant to fish and wildlife.

o Chemical Characteristics

Daminozide is a white, crystalline solid with slight to no odor. Daminozide is soluble in water, methanol and acetonitrile, but insoluble in xylene and aliphatic hydrocarbons. Daminozide has a melting point range from 154 to 156°C. Technical daminozide contains at least 99 percent active ingredient.

o Toxicological Characteristics

The LD50 and Toxicity Categories for daminozide are: acute oral (8.4 g/kg, IV), acute dermal (>16 g/kg, III), acute inhalation (>147 mg/kg, IV), primary eye irritation (mild, none at this time), dermal irritation (mild, IV). Daminozide does not produce mutagenic or teratogenic effects. Data are insufficient to judge the effects of daminozide on reproduction. Daminozide causes oncogenic effects in laboratory animals.

o Physiological and Biochemical Behavioral Characteristics

Data indicate that daminozide is rapidly absorbed through the leaves, roots and stems. Daminozide is translocated in plants and can accumulate in roots, fruit, etc. Adequate methods are available to detect daminozide. A method to detect the UDMH metabolite down to 1 ppb must be validated to confirm the presence of UDMH residues in plants. Components of the final residues have not been adequately identified or quantified. The majority of daminozide residues ingested by milk animals is rapidly excreted in the urine and feces.

o Environmental Characteristics

Degrades in water to unsymmetrical 1,1-dimethylhydrazine (UDMH), a known oncogen. Daminozide appears to resist photodegradation, but is degraded by soil microorganisms. Daminozide appears to leach, but since it does not persist in soil, the potential for ground water contamination is small. Daminozide does not bioconcentrate in fish nor does it accumulate in rotational crops.

o Ecological Characteristics

Daminozide has low acute toxicity to fish and terrestrial wildlife. No data are available to assess the ecological hazard from the UDMH hydrolysis product/contaminant. Problems with Endangered Species: None known at this time.

o Tolerance Assessment

A final reassessment of all tolerances cannot be made at this time until the data gaps specified by the Standard are filled.

o Problems with Use

Extended storage of solutions of daminozide result in excessive hydrolysis of the active ingredient to UDMH.

Regulatory Position & Rationale

o Use Clasiification

Daminozide is classified as a General Use Pesticide.

o Use Restrictions

None.

o Unique Warning Statements

Solutions of daminozide must be used within 24 hours after preparation.

o Benefit Analysis

Approximately 825,000 pounds of daminozide are produced annually with apples and peanuts accounting for 600,000 pounds and 225,000 pounds of the annual usage, respectively. Without daminozide, short term revenue losses are projected to range up to $30 million annually for apples and from $4.3 to $10.7 million annually for peanuts.

o Risk Analysis

Significant exposure to daminozide and UDMH can occur via consumption of raw and processed agricultural commodities treated with daminozide. The Agency's preliminary estimate of oncogenic dietary risk for daminozide is high. There are insufficient data to quantify the oncogenic dietary risk of UDMH at this time. The oncogenic nondietary risk for daminozide and UDMH may not be significant.

o Special Review

Registrants of daminozide products are notified, via the Guidance Document, that daminozide meets the oncogenicity risk criterion in 40 CFR 162.11(a) and will undergo a Special Review. The Agency will not reregister any current products and it will not register any new products containing daminozide until Special Review is completed and the Agency has received commitment to fulfill data requirements.

Summary of Major Data Gaps

Data gaps and time [in months] allowed to perform studies: toxicology (chronic testing [48], teratology [12], reproduction [24], general metabolism [12] and mutagenicity [6]), product chemistry (product identity, analysis and certification of product ingredients, physical and chemical characteristics) [6], environmental fate (degradation [6], photodegradation [6], metabolism [24], mobility [6], dissipation [24], accumulation [24] and reentry [24], residue chemistry (metabolism in plants and animals [12], analytical methods and residue data [12], residue data [12]), and ecological effects (avian and mammalian testing and aquatic organism testing) [48].

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